

PROCEEDINGS
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CRITICAL REMARKS ON PHILIPPINE ISLAND LAND
SHELLS.¹

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Large sendings from Palawan and the adjacent regions have made it necessary to overhaul the groups of *Cochlostyla* typified by Pfeiffer's *cinerosa* and *palawanensis*. The results of this inquiry are in part given below. These sendings, mostly collected by Mr. C. M. Weber, have also made it necessary to recognize two additional races of *Amphidromus versicolor* which come from the heretofore unexplored islands of Secam and Canabungan. These are here described. A third subspecies of *Amphidromus*, from the island of Mindanao, received some time ago from Mr. Walter F. Webb, which belongs to the *Amphidromus maculiferus* group, is added.

***Cochlostyla cinerosa cinerosa* Pfeiffer.**

1855 *Bulimus cinerosus*, Proc. Zool. Soc. London, p. 107, pl. 32, f. 5.

Pfeiffer's specimens, he states, were collected by Dr. H. E. I. C. Traill in Palawan Passage, near Borneo. The definite island from which they came is not stated and none of the specimens in our collection from the Philippines agree exactly with Pfeiffer's description or figure, although they plainly belong to the same complex. The fixing of the type locality for this subspecies will therefore have to await future sendings. Pfeiffer states that the type has 5 whorls and measures: altitude, 36.5 mm.; diameter, 13 mm.

***Cochlostyla cinerosa trailli* Pfeiffer.**

1855 *Bulimus trailli*, Proc. Zool. Soc. London, p. 107, pl. 32, f. 6.

The above description and figure depict a very dark shell with a light band at the summit. It is quite possible that the lighter epidermis was lost in this specimen and that only the sutural band remains. However, there is also considerable difference in general shape, so that we shall consider it

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distinct from *Cochlostyla cinerosa cinerosa*, although it may possibly turn out to be simply a mutation of that form. We have not seen specimens of this race, either. It also was collected by Dr. Traill in Palawan Passage, near Borneo. Pfeiffer gives the following measurements: number of whorls, 5; altitude, 36 mm.; diameter, 22mm.

***Cochlostyla cinerosa balabacensis*, new subspecies.**

This shell strongly suggests *Cochlostyla palawanensis graellsii* in color and markings but it is much more slender and much smaller than that shell. Six specimens give the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
208223	U. S. N. M.	6.0	39.8	25.3	21.8	Delawan	Quadras
"	"	5.7	34.5	24.3	20.4	"	"
1	"	6.2	37.8	24.4	20.7	"	"
"	"	5.5	34.5	25.3	21.0	"	"
66209	"	6.0	35.1	24.8	21.3	Balabac	Steere
	Chicago Academy	5.7	34.4	24.3	21.3	"	Quadras

¹Type.

***Cochlostyla cinerosa higginsii*, new subspecies.**

This race lacks the strong axial striping, the last whorl being uniform buff gray. The specimen was collected by Mr. C. M. Weber on Bessie Island, and was donated by Mr. H. C. Higgins. The type, Cat. No. 336,046, U. S. N. M., yields the following measurements: number of whorls, 5.6; altitude, 36.2 mm.; greater diameter, 23.4 mm.; lesser diameter, 20.9 mm.

***Cochlostyla cinerosa ulugana*, new subspecies.**

A lot of specimens collected by the U. S. Bureau of Fisheries Steamer *Albatross* on the Philippine Expedition at Ulugan Bay, on the central west coast of Palawan, are of a pale chocolate color, slightly, obscurely, obliquely banded; with slender darkish fenestrations near the summit, and showing a dark peripheral band when denuded of epidermis. To this race the above name may be applied. Ten specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
256138	U. S. N. M.	5.5	34.9	23.0	20.1	Ulugan Bay	U. S. B. F.
"	"	5.4	35.3	23.9	20.9	"	"
"	"	5.9	37.7	24.2	21.0	"	"
"	"	5.5	33.8	22.9	19.5	"	"
"	"	5.6	34.7	22.5	19.7	"	"
"	"	5.7	35.9	23.6	20.3	"	"
"	"	5.5	33.5	22.5	20.3	"	"
"	"	5.5	35.7	24.1	21.3	"	"
1	"	5.5	35.8	23.2	19.8	"	"
"	"	5.5	34.4	23.2	20.2	"	"

¹Type.

Cochlostyla cinerosa tagbayugana, new subspecies.

A lot of shells collected by the Bureau of Fisheries' Steamer *Albatross* in Tagbayug Bay, on the south coast of southern Palawan, are decidedly more ovoid than the last named race. Unfortunately all the specimens are devoid of epidermis so that the color pattern can not be described. The shells may or may not have a dark peripheral band. Fifteen specimens yield the following measurements:

Cat. No.	Collection.	Number whorls,	Altitude,	Greater diameter,	Lesser diameter	Locality.	Collector.
256116	U. S. N. M.	5.0	29.4	21.9	19.3	Tagbayug Bay	U. S. B. F.
"	"	4.8	27.7	22.0	18.3	"	"
"	"	5.0	30.3	22.8	18.8	"	"
"	"	5.3	32.0	24.2	20.4	"	"
"	"	4.9	25.2	20.2	17.5	"	"
"	"	5.1	30.0	21.5	18.8	"	"
"	"	5.0	27.5	21.4	17.9	"	"
"	"	4.5	24.9	20.7	17.8	"	"
1 "	"	5.0	29.9	22.3	19.1	"	"
"	"	5.0	29.9	22.5	19.2	"	"
"	"	4.9	27.3	21.0	18.0	"	"
"	"	4.9	27.1	21.0	18.2	"	"
256098	"	5.0	29.8	23.0	19.6	"	"
"	"	5.1	30.5	22.4	19.0	"	"
"	"	5.0	31.9	23.0	19.5	"	"

¹Type.

Cochlostyla cinerosa tidepolensis, new subspecies.

A slender form with dark apex followed by buff turns and terminating in the usual axial streaking of buff and brown on the last turn is before me from Tidepole Island, which may be known under the above designation.

The type, Cat. No. 310,083, U. S. N. M., has 5.3 whorls and measures: altitude, 36.4 mm.; greater diameter, 18.9 mm.; lesser diameter, 5.3 mm.

COCHLOSTYLA PALAVANENSIS Pfeiffer.

This complex appears to have been greatly misunderstood. Most of the authors seem to have confused *Cochlostyla satyrus* Broderip with it. The specimens from southern Palawan agree perfectly with Pfeiffer's diagnosis and I shall therefore restrict Pfeiffer's name to the material from that region.

An accumulation of specimens from other parts of the island show that we will have to recognize some additional races from the large island of Palawan, but I shall refrain from that until more material will have come to hand which will give us a better understanding of the distribution of the various races than the present collection would permit.

There are, however, a number of races which come from offlying islands that demand recognition at the present time. These from the south northward are:

***Cochlostyla palavanensis graellsii* Hidalgo.**1886 *Cochlostyla graellsii*, Journ. de Conch., vol. 35, p. 155, pl. 8, f. 5.This is the large *Cochlostyla* on Balabac Island, a very strongly marked race of *palavanensis* usually showing a dark sutural band.

Twenty-five specimens taken at random yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.
336038	U. S. N. M.	5.7	44.4	30.8	25.8	Delawan Valley, Balabac.
"	"	6.1	45.0	29.4	25.0	"
"	"	6.1	45.4	30.0	24.8	"
"	"	6.2	46.0	30.2	25.2	"
"	"	6.1	47.4	30.3	25.2	"
"	"	6.1	46.5	31.0	26.8	"
"	"	6.4	49.4	30.4	26.3	"
"	"	6.0	46.9	29.6	24.5	"
"	"	6.0	46.8	28.5	24.2	"
"	"	6.1	50.4	32.1	26.9	"
"	"	6.1	48.9	31.0	27.2	"
"	"	6.1	46.7	29.9	25.7	"
"	"	6.1	43.5	27.7	23.9	"
"	"	6.3	48.4	28.8	24.4	"
"	"	6.4	50.8	31.5	26.2	"
"	"	6.1	47.3	32.3	26.5	"
"	"	6.1	43.8	27.5	24.0	"
"	"	6.1	44.9	28.7	23.9	"
"	"	6.0	49.3	32.7	26.9	"
"	"	6.2	45.7	30.5	25.4	"
"	"	6.0	43.9	27.8	23.8	"
"	"	6.1	47.2	30.3	26.4	"
"	"	5.8	42.3	29.8	24.7	"
"	"	6.6	49.1	29.0	25.2	"
"	"	6.5	47.3	30.0	24.8	"

***Cochlostyla palavanensis mantangulensis*, new subspecies.**

On the island of Mantangule we have a small race of this species in which we may have the alternate light and dark axial streaking, or sometimes the light gray epidermis almost completely envelops the last whorl. Ten specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.
336035	U. S. N. M.	6.0	39.8	23.9	20.3	Mantangule Id.
"	"	6.0	42.8	24.5	20.2	"
"	"	5.9	40.9	26.3	21.9	"
"	"	6.0	40.0	22.3	19.5	"
"	"	6.0	40.7	24.4	20.6	"
"	"	5.8	43.3	27.5	22.8	"
¹	"	5.9	43.2	25.3	22.5	"
"	"	6.0	43.0	26.3	22.2	"
"	"	6.1	41.6	26.8	22.8	"
"	"	6.3	45.3	25.9	20.0	"

¹Type.

Cochlostyla palavanensis bancalanensis Bartsch.

In 1918 we described the above subspecies in these Proceedings, volume 31, pp. 200-201. There is no need to repeat here except to say that this race from Bancalan Island is paler and less contrastedly streaked than the other forms mentioned.

Cochlostyla palavanensis culionensis, new subspecies.

This is the mollusk which von Möllendorff considered *Cochlostyla satyrus librosa*. *Cochlostyla librosa* Pfr., however, is a different race of *palavanensis* occurring in Palawan, as I shall point out when I come to discuss the Palawan members. The present race appears without a name. It is much less strongly banded than the forms heretofore discussed and has a tendency toward fenestration near the suture.

Four specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
1195425	U. S. N. M.	5.5	43.7	26.9	23.3	Culion Id.	Möllendorff
"	"	5.9	44.3	27.9	23.9	"	"
"	"	5.5	43.7	29.8	25.4	"	"
80	Chicago Academy	5.7	42.8	28.3	23.6	"	"

¹Type.

Cochlostyla weberi, new species.

Shell depressed helicoid, thin, semitranslucent, white, excepting the region about the columellar area which is pale yellow. The exposed portion of the whorls is well rounded, separated by a well impressed suture, marked by decidedly retractive lines of growth. Periphery of the last whorl rounded; the convexity of the spire and the base, however, lends to it the aspect of having an obtuse angulation. Base marked like the spire, the convexity equalling that of the upper portion of the whorl. Aperture oblique, broadly oval; outer lip thin, slightly thickened at the edge, and only moderately reflected; columella very oblique, decidedly excavated; parietal wall glazed with a scarcely perceptible callus. The very thin epidermis has a somewhat crinkly appearance which gives one the impression of obsolete microscopic spiral striations which, however, are not apparent when one examines the shell under the microscope.

Three adult and an equal number of juvenile individuals are in our collection. The adult shells yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
336032	U. S. N. M.	4.1	18.9	27.0	21.8	Candaraman Id.	Weber
256040	"	4.0	18.9	28.7	22.0	"	U. S. B. F.
1336048	"	4.2	21.5	32.4	24.8	"	Higgins

¹Type.

***Amphidromus versicolor secamensis*, new subspecies.**

Seventy-five specimens collected by Mr. Weber on Secam Island are before me, all of which have the dark tip characteristic of *versicolor*. but only one of which shows the dark flammulations on the early whorls. The rest are unicolor, or occasionally with hydrophanous lines. The general color varies from white through pale yellow to green. There is a tendency in some of the specimens to show the red sutural band characteristic of *Amphidromus quadrasii*. The lip in about half of the material is dark edged and a rosy tint surrounds the columella in about half the specimens. There is a great variation in the size of this race.

Twenty-five specimens taken at random measure:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter.	Locality.	Collector.
336029	U. S. N. M.	6.8	41.8	20.8	17.7	Secam Id.	Weber
"	"	6.2	31.9	17.9	15.4	"	"
"	"	6.8	40.0	20.5	17.1	"	"
"	"	6.0	29.8	16.1	14.3	"	"
"	"	6.0	31.9	18.3	15.8	"	"
"	"	6.9	44.9	22.2	18.3	"	"
"	"	6.8	35.6	18.8	15.8	"	"
"	"	6.1	30.6	16.5	14.4	"	"
"	"	6.0	29.8	17.5	14.8	"	"
"	"	6.0	28.0	16.0	13.2	"	"
"	"	6.3	32.8	17.5	15.3	"	"
"	"	7.0	42.3	22.0	18.2	"	"
1	"	6.9	40.7	21.5	17.7	"	"
"	"	6.0	30.0	16.8	14.0	"	"
"	"	6.1	30.0	17.6	14.9	"	"
"	"	6.4	35.4	19.8	17.0	"	"
"	"	7.0	39.3	20.7	17.7	"	"
"	"	6.2	35.0	19.0	15.5	"	"
"	"	6.1	28.5	16.7	14.0	"	"
"	"	6.1	31.4	18.4	15.7	"	"
"	"	6.2	32.9	17.8	15.3	"	"
"	"	6.5	39.4	21.0	18.3	"	"
"	"	6.8	37.8	19.8	16.0	"	"
"	"	7.0	37.8	18.3	15.3	"	"
"	"	6.4	32.8	17.4	15.0	"	"

¹ Type.

***Amphidromus versicolor canabunganensis*, new subspecies.**

Mr. Weber has sent us sixty-two specimens of dark tipped *Amphidromus* from Canabungan Island. These are bright yellow suffused with green. Almost half of the specimens have the last whorls streaked with axial lines of green which are almost sufficiently closely spaced to render the whole whorl of a green tint. A few of the specimens are almost white. Two of the specimens have the characteristic flammulations on the early whorls. A number have dark lips. A few have a mere indication of pinkish at the columellar area.

Twenty-five of these taken at random measure:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter.	Locality.	Collector.
336030	U. S. N. M.	7.1	43.0	20.7	17.7	Canabungan Id.	Weber
"	"	7.1	43.3	19.8	17.5	"	"
"	"	7.1	40.3	17.5	14.5	"	"
"	"	7.0	39.8	16.5	14.4	"	"
1	"	7.7	41.5	18.0	15.0	"	"
"	"	6.9	38.2	18.5	15.2	"	"
"	"	7.9	45.5	19.1	16.8	"	"
"	"	7.1	42.5	20.8	17.9	"	"
"	"	6.7	34.0	17.8	14.9	"	"
"	"	6.8	39.6	19.9	17.2	"	"
"	"	6.7	32.3	16.3	14.0	"	"
"	"	7.1	38.8	17.8	14.9	"	"
"	"	7.0	39.5	18.7	16.3	"	"
"	"	7.0	38.2	17.8	15.9	"	"
"	"	7.7	39.8	16.5	13.9	"	"
"	"	7.0	36.3	17.0	15.5	"	"
"	"	6.9	38.9	19.1	16.4	"	"
"	"	6.9	36.9	18.3	15.8	"	"
"	"	6.9	35.8	18.8	15.7	"	"
"	"	7.4	42.8	19.7	17.2	"	"
"	"	6.5	37.0	18.9	16.0	"	"
"	"	6.7	39.8	18.9	16.2	"	"
"	"	6.7	34.2	18.3	15.7	"	"
"	"	7.0	40.9	20.7	17.5	"	"
"	"	7.4	30.3	18.5	15.4	"	"

¹ Type.

***Amphidromus maculiferus webbi*, new subspecies.**

This race of *Amphidromus maculiferus* is most nearly related to *Amphidromus maculiferus buluanensis* Bartsch. Like that race it is devoid of maculations, and like it, it is provided with strong dark brown varicial bands. It differs from *Amphidromus maculiferus buluanensis* in having the ground color yellow instead of buff. In fact, this is the only member of the *maculiferus* complex which has this coloration.

The type and two specimens of this subspecies, Cat. No. 217,035, U. S. N. M., were donated by Mr. Walter F. Webb. They were collected at Cabacan, Cotabato, Mindanao. These specimens measure:

Number of whorls.	Altitude.	Diameter.
¹ 7.1	63.4	33.4
7.0	61.0	30.0
7.0	59.5	29.0

¹ Type.